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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,628	03/12/2004	Harry E. Flynn	2019	6686

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EXAMINER	
FIORITO, JAMES	
ART UNIT	**PAPER NUMBER**
1754	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/798,628	FLYNN ET AL.	
	Examiner	Art Unit	
	James A. Fiorito	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-7, 12 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Weaver '049.

Weaver discloses a process for producing particulate solid titanium dioxide comprising: (a) reacting gaseous titanium tetrachloride and oxygen to produce solid particulate titanium dioxide and gaseous reaction products in an oxidation reactor; (b) quenching the particulate titanium dioxide and gaseous reaction products with a recycled stream of gaseous reaction products which has been previously cooled by injecting a portion of the cooled recycled stream of gaseous reaction products into a zone in the reactor where the reaction is complete and titanium dioxide primary particles are no longer growing in size, said recycled gaseous reaction products being injected at a pressure of less than 75 psig above the reactor pressure, and at a temperature significantly less than the reactor temperature at the zone of injection; (c) cooling the quenched particulate titanium dioxide and gaseous reaction products in a tubular heat exchanger; (d) separating the cooled particulate titanium dioxide from the cooled gaseous reaction products; and (e) recycling a portion of the cooled gaseous reaction products, from which the titanium dioxide has been removed as in step (d), to the

reactor to provide the quench as called for in step (b) (Column 1, line 8-5; Column 2, line 54-69; Column 3, line 31-74).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, and 4-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hilgers '168.

Hilgers discloses a process for producing particulate solid titanium dioxide comprising: (a) reacting gaseous titanium tetrachloride and oxygen to produce solid particulate titanium dioxide and gaseous reaction products in an oxidation reactor; (b) quenching the particulate titanium dioxide and gaseous reaction products with a recycled stream of gaseous reaction products which has been previously cooled by injecting a portion of the cooled recycled stream of gaseous reaction products into a zone in the reactor where the reaction is complete and titanium dioxide primary particles are no longer growing in size, said recycled gaseous reaction products being injected at room temperature at the zone of injection; (c) cooling the and gaseous reaction products; (d) separating the particulate titanium dioxide from the gaseous reaction products in a pipe; and (e) recycling a portion of the cooled gaseous reaction products,

from which the titanium dioxide has been removed as in step (d), to the reactor to provide the quench as called for in step (b) (Column 9, Example 3).

Hilgers does not expressly state that the quenched particulate titanium dioxide is cooled. However, it would have been obvious to cool the particulate in order to more safely ship and store the particles.

Hilgers does not expressly state that the gaseous reaction products are cooled in a tubular heat exchanger. However, it would have been obvious to use a tubular heat exchanger to cool the gas phase products of the reaction required by Hiligers, before recycling them to the reactor via a pipe (Column 9, Example 3).

Hilgers does not expressly state the recycled gaseous reaction products are injected at a pressure of less than 75 psig above the reactor pressure. However, it would have been obvious to return the gaseous product to the reactor near to the pressure of the reactor, to avoid the excess cost of pressuring the recycle stream (Column 9, Example 3).

With respect to claim 8, Hilgers does not expressly state that the quench fluid has been cooled sufficiently to transform to a liquid phase prior to injecting into the reactor. However, it would have been obvious to cool the reaction products of Hilgers sufficiently to transform to a liquid phase prior to injecting into the reactor in order to store the gaseous product more efficiently in smaller containers before being recycled to the reactor.

With respect to claim 11 and 19, Hilgers discloses that the quench fluid is injected into the reactor at a point downstream of the point in the reactor where oxygen and titanium tetrachloride are first reacted.

Hilgers does not expressly state the length between the point where oxygen and titanium tetrachloride are first reacted and the point in which the quench fuel is injected. However, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and the device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hilgers '168 in view of Yuill '893.

Hilgers does not expressly state that the quenched titanium dioxide particles and gaseous reaction products are made to follow a spiral path as they flow through the tubular heat exchanger.

Yuill teaches the quenched titanium dioxide particles and gaseous reaction products are made to follow a spiral path as they flow through the tubular heat exchanger (Column 1). Hilgers and Yuill are analogous art because they are from the same field of endeavor, namely titanium oxide processes.

At the time of invention it would have been obvious to a person of ordinary skill in the art to form the process of Hilgers to include the quenched titanium dioxide particles

and gaseous reaction products are made to follow a spiral path as they flow through the tubular heat exchanger in view of the teaching of Yuill. The suggestion or motivation for doing so would have been to provide a means of cooling the reaction products as required by Hilgers, and to increase the removal of the deposits from the surfaces of the heat exchanger thereby increasing the heat transfer efficiency of the heat exchanger (Column 1).

Response to Arguments

Applicant's arguments filed 7/28/06 have been fully considered but they are not persuasive. The applicant argues that the quenching of Weaver does not occur with in the reactor. However, it appears that the quenching of the titanium dioxide particles produced by Weaver are inherently quenched within the reactor.

The applicant also argues that the quenching of Hilgers does not occur where the reaction is essentially complete. However, it would be obvious to quench only the particles where the reaction forming the particles is essentially complete in order to increase the efficiency of product yield from the process.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Fiorito whose telephone number is (571)272-7426. The examiner can normally be reached on 9am - 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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